

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-38 (canceled)

39. (currently amended) A method for protecting against short circuit in an electric power distribution architecture including a first battery assembly B1 for generating a first voltage level, a second battery assembly B2 for generating a second voltage level that is substantially higher than the first voltage level, a converter DC/DC coupled between the first and second battery assemblies, and at least one power distribution unit (10), (20), (30) for receiving at least one of the first and second voltage levels to connect/disconnect at least one load (12), (22), (23), (32), (33), the method comprising:

receiving a first voltage signal which corresponds to an amount of voltage measured from an output of the converter DC/DC that is compared to a first predetermined voltage range of the first voltage level,

receiving a second voltage signal which corresponds to an amount of voltage measured from an input of the converter DC/DC that is compared to a second predetermined voltage range of the second voltage level;

assessing a state of the converter DC/DC in response to the first and second voltage signals;

determining ~~the presence of a short circuit condition~~ if at least of one the first voltage signal indicates that the measured that the measured voltage at the output of the converter DC/DC exceeds the first predetermined value and the second voltage signal indicates that the measured voltage at the input of the converter DC/DC exceeds the second predetermined value;

controlling the at least one power distribution unit (10), (20), (30) to control the at least one load (12), (22), (23), (32), (33) to remain connected in response to the at least of one the first voltage signal indicating that the measured that the measured voltage at the output of the converter DC/DC exceeds the first predetermined value and the second voltage

signal indicating that the measured voltage at the input of the converter DC/DC exceeds the second predetermined value;

measuring a voltage across a first battery within first battery assembly ~~to continue to confirm the presence of the short circuit condition~~, wherein the measured voltage across the battery is compared to a predefined voltage level in response to controlling the at least one power distribution unit (10), (20), (30) to control the at least one load (12), (22), (23), (32), (33) to remain connected;

measuring an input current across the first battery ~~to continue to confirm the presence of the short circuit condition~~ and to compare the measured input current to a predetermined load current in response to determining that the measured voltage across the first battery is below the predefined voltage level;

determining the presence of a short circuit condition in response to determining that the measured input current is above the predetermined load current;

controlling the at least one power distribution unit (10), (20), (30) to selectively disconnect the at least one load (12), (22), (23), (32), (33) in response to determining that the measured input current is above the predetermined load current;

measuring a load impedance of the at least one load prior to reconnecting the at least one load; and

comparing the measured load impedance of the at least one load to a predetermined impedance range prior to reconnecting the at least one load to prevent damage to the at least one load in the event the measured impedance is not equal to a value within the predetermined impedance range.

40. (previously presented) The system of claim 20 wherein the module SMM is further adapted to control the at least one power distribution unit to connect/disconnect the loads via at least one power switch in response to the first and the second voltage signals.

41. (previously presented) The system of claim 40 wherein the at least one power distribution unit measures an output of the at least one power switch to determine load impedance of the at least one load coupled to the output of the at least one power switch in

response to the module SMM controlling the at least one power distribution unit to disconnect the at least one load, and the at least one power distribution unit compares the measured load impedance of the at least one load to a predetermined impedance range prior to reconnecting the at least one load to prevent damage of the at least one load in the event the measured impedance is not equal to a value within the predetermined impedance range.

42. (previously presented) The method of claim 30 wherein controlling the at least one power distribution unit to connect/disconnect the at least one load in response to the first and second voltage signals further comprises controlling the at least one power distribution unit to connect/disconnect the at least one load with at least one power switch.

43. (previously presented) The method of claim 42 further comprising measuring an output of the at least one power switch to determine a load impedance of the at least one load coupled to the output of the at least one power switch in response to controlling the at least one power distribution unit to disconnect the at least one load based on the first and the second voltage signals and comparing the measured load impedance to the predetermined impedance range prior to reconnecting the at least one load to prevent damage of the at least one load in the event the measured impedance is not equal to a value within the predetermined impedance range.

44. (new) The method of claim 39 wherein comparing the measured load impedance of the at least one load to the predetermined impedance range prior to reconnecting the at least one load to prevent damage to the at least one load in the event the measured impedance is not equal to the value within the predetermined impedance range further comprises comparing the measured load impedance of the at least one load to the predetermined impedance range prior to reconnecting the at least one load within the same key ignition cycle as controlling the at least one power distribution unit to selectively disconnect the at least one load.

45. (new) The method of claim 39 wherein the predefined voltage level, the predetermined load current, and at least one of the first and the second predetermined voltages

are parameters that are to be exceeded to ensure that the module SMM avoids detecting the presence of an erroneous short detection within the architecture.

46. (new) A system for protecting against a short circuit in an electric power distribution architecture having a first battery assembly for generating a first voltage level, a second battery assembly for generating a second voltage level that is substantially higher than the first voltage level, a converter DC/DC coupled between the first and second battery assemblies, and at least one power distribution unit for receiving at least one of the first and second voltage levels, the system comprising:

a module SMM operably coupled to:

the converter DC/DC having an input operably coupled to the second battery assembly and an output coupled to the first battery assembly, wherein the converter DC/DC is adapted to generate a first voltage signal indicative of an amount of voltage measured at the output and to generate a second voltage signal indicative of an amount of voltage measured at the input; and

at least one power distribution unit operably coupled to at least one load,

wherein the module SMM is configured to:

compare the first voltage signal to a first predetermined voltage range;

compare the second voltage signal to a second predetermined voltage;

measure a voltage across a first battery positioned within the first battery assembly for comparison to a predefined voltage level;

measure an input current across the first battery for comparison to a predetermined load current; and

control the at least one power distribution unit to disconnect all loads and to determine that a short circuit condition exists within the architecture in response to the module SMM determining that the measured voltage exceeds the predefined voltage level, the measured input current exceeds the predetermined load current, and at least one of the first

voltage signal exceeding the first predetermined voltage and the second voltage signal exceeding the second predetermined voltage; and

wherein the predefined voltage level, the predetermined load current, and at least one of the first and the second predetermined voltages are parameters that are to be exceeded to ensure that the module SMM avoids detecting the presence of an erroneous short detection within the architecture.

47. (new) The system of claim 46 wherein the module SMM is coupled to the second battery assembly and the module SMM is further adapted to control the second battery assembly to disconnect itself in response to determining that the measured input current is above the predetermined load current after the module SMM disconnects all the loads.

48. (new) The system of claim 46 wherein the module SMM is further configured to control the at least one power distribution unit to reconnect one load at a time, while within the same ignition key cycle of disconnecting the at least one load so that each load is evaluated, in response to determining at least one of the measured voltage being within the predefined voltage level, the measured input current being within the predetermined load current, and the at least one of the first voltage signal being within the first predetermined voltage and the second voltage signal being within the second predetermined voltage.

49. (new) The system of claim 46 wherein the module SMM is further configured to control the at least one power distribution unit to measure an impedance across each load prior to reconnecting each load and within the same ignition cycle of disconnecting the loads and to compare the measured impedance to a predetermined threshold to determine which particular load within the loads caused the short circuit condition.

50. (new) The system of claim 49 wherein the module SMM is further configured to control the power distribution unit to prevent the particular load that includes an impedance above the predetermined threshold from being reconnected.